

Nat. Agric. Society

NEW-YORK

State Agricultural Society's

TRIAL OF IMPLEMENTS

A T

G E N E V A ,

JULY, 1852.

ALBANY:

CHARLES VAN BENTHUYSEN, PRINTER,
No. 407 Broadway.

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REPORT

OF THE

Committee on Trial of Implements at Geneva,

JULY, 1852.

*To the Executive Committee of the
New-York State Agricultural Society :—*

GENTLEMEN—When we received your invitation to attend a trial of implements and machinery, to ascertain by actual and thorough trial, their uses and merits, the impression was generally entertained that comparative merits would occupy the attention of the judges and satisfy the desires of the Society.

When, however, the judges assembled in Geneva on the 20th day of July, one only being absent,* it became at once evident that the scrutiny would not be confined to a comparison of results; a demand seemed to exist and was unanimously admitted, that the examination should be conducted as far as practicable with a design to prove that the more efficient *artificial*, as well as natural agents which ingenuity and skill can present to the farmer, the greater will be the amount of labor consumed in cultivation; and in proportion to the skill and industry employed in the adaptation and use of artificial agents, so will be the quantity of products, or commodities for interchange among men. It was admitted also that the substitution of well constructed machinery for economizing human labor, must ameliorate the condition of the people, and increase every comfort and enjoyment.

With these views, your committee entered upon their duties, and arranged a system for determining the mechanical principles combined in the machines presented for trial, in order to under-

* Mr. Kirkland, of Rensselaer county, was unavoidably absent.

stand more clearly, and better to exhibit to our farming people, the power possessed by these machines to overcome or divide resistances with economy of time and labor, in the accomplishment of the work of a farm.

This system embraced the determination of the power applied, the quantity of force required for giving motion as well to the machine alone, as also to effect perfect work when in full action ; the speed required or used ; the force or power consumed to perform a specific amount of work ; the quality of the work accomplished ; the condition of the surface acted on ; the construction and liability to wear, and other details which are presented under the various divisions of this report.

This system seemed important and interesting, not only for the advantage of agriculturists, but also for the mechanics of our country. Your committee indulge the belief that this trial of machines and implements will present to the farmer a reliable authority for a due appreciation of such objects when presented for his use. It must be conceded that great improvement has been observed within the last five years in the construction of plows and a few other farm implements, and much ingenuity has been displayed in other and more complex machinery for the farm, yet it is equally true, there is an absence of a sufficient knowledge of the essential principles of construction and application of agricultural implements.

It is no discredit to our artizans or farmers to say that with all the knowledge we have attained, our requirements are very far from being met or satisfied, and that the rudiments of agricultural machinery are rarely sufficiently understood by either farmers or mechanics. The many thousand persons assembled at the Geneva trials, afford a conclusive evidence that this first effort of the State Society to make apparent the value, or the imperfections of implements and machinery, to the eye of all interested in their uses and application, will cause greater attention to mechanical principles, lessening the powers of draft, and of resistance ; relieving us also from an excessive demand upon the physical energies.

THE TRIAL GROUNDS.

The grounds selected for the trials, were favorably situated about one mile from the beautiful village of Geneva, on the estate

of Mr. Horace L. Bennett. The meadow appropriated to the several mowing machines, presented a gently sloping surface, the most elevated portion having a gravelly surface soil with many loose cobble stones; the lower part of the field exhibited a loose vegetable black mould, rough and uneven, as if poached by feeding herds.

The grass was thin and wiry, consisting of red top, florin,* and timothy, varying from eighteen inches to two feet in height; aquatic grasses occupied much of the lower ground.

This field was accurately surveyed and laid out in parallelograms, each containing an area of two acres; each area was marked by stakes numbered consecutively from 1 to 10.

A meadow on the farm of Mr. Sherman was also selected as having a growth of heavy grass, on which to test the power of the mowing machines; this field was covered chiefly with timothy grass, with a thick bottom herbage springing from a vegetable mold; the lower portion of the meadow was naturally wet, sending up a growth of water grasses from a bog surface; the sedges were about four feet long, the red top rose to three feet, the timothy measured three feet six inches in length, and the water meadow grass was as long as the timothy. Much of the grass on this field was lodged and tangled. Both meadows would have severely tasked the efforts of the most experienced mowers, and the temper of the most approved scythe; they afforded therefore a good test for the power and capacity of machines for mowing.

The wheat field, comprising about thirty acres, presented an undulating surface, with a water course or deep furrow through portions of it; a few trees and stumps, with here and there a boulder offered occasional impediments, and the whole field presented as many and as varied obstacles to farm machinery and labor, as will occur probably on any property where machinery can be profitably employed. The wheat crop on the ground was of the Mediterranean and Soules varieties, injured in some degree by the wheat fly; small portions of the field were lodged; and with the exception of low moist places the grain was in proper condition for harvesting. The soil of this field is a clay loam, a specimen of which is deposited in the Society's museum for reference when desired.

* Sometimes called *foul meadow*.

The barley field containing about 30 acres, was more uneven as to its surface; deep irregular water courses traversed its length; the water standing in some portions; many boulders and stumps were in the track of the machines; the grain was much lodged and tangled; the straw soft and tough. The soil of this field is a clay loam, though more sandy in its proportions than the wheat field; a specimen of this soil is also deposited in the Society's museum. The committee believe that a combination of difficulties equal to the many presented on this field to the machines on trial, can rarely occur.

Both the wheat field and barley field were accurately surveyed and laid out in lots containing areas of two acres each, marked by numbered stakes in consecutive order from 1 to 12. A track for the teams to enter was opened by cradles between each lot.

The several areas of the wheat and of the barley field were appropriated to the exhibitors by lot; the numbers drawn by them respectively, designating the number of the lot on which to operate; the numbers prefixed to the exhibitors names in the several tables in this report indicate the position of each.

An adjacent field, plowed during the second day of the trial, afforded ample space for the trial of Grain Drills and Cultivators; the long continued dry weather during the month of July acting upon a clay soil, caused the furrows to be rough and baked in large masses, presenting a surface not to be easily pulverised; consequently tasking the merits or powers of each Cultivator to reduce the soil to a proper tilth, and every Grain Drill to distribute seed at equal distances and at uniform depths.

The upper, or highest level ground of the barley field was raked, bound and housed, or removed, affording a favorable stubble ground for a second trial of Cultivators, the action of which having reduced the soil to a condition suitable for planting, it was appropriated to the trial of corn and seed planters. These machines were worked on areas, marked, numbered and planted by each machine, with the intent to note, especially, the results, after vegetation had advanced the plants a few inches above the surface.

To aid the efforts of the State Society, and to promote the farming interests, the inhabitants of Geneva caused a large area of a meadow adjoining the wheat and barley fields to be covered with the spacious canopys prepared by Mr. E. C. Williams, of Rochester.

One of these immense tents afforded space for the horse powers where motion was applied on the principle of the endless chain; the various powers were arranged on a line with the walls of the tent in a manner to permit the application of power to the several machines.

Another tent gave protection to machines and implements until they were called to the field for trial.

A tent was also appropriated to the exhibition of implements and machinery not subject to trial; other tents were erected for the comfort and convenience of attending visitors, and for the officers and judges of the State Society, with abundant refreshments; every wish was liberally anticipated, and every needful appliance prepared for the objects to be accomplished.*

With these arrangements and preparations, the judges entered upon the examination and trial of the implements and machines submitted to them, and according to the following list of entries presented by Mr. Secretary JOHNSON:

LIST OF ENTRIES:

Reaping Machines.

J. H. Manny, Wadham's Grove, Ill., Reaping Machine, "Manny's Patent Adjustable."

Byron Densmore, Brockport, N. Y., Reaping Machine.

C. H. McCormick, Illinois, Reaping and Mowing Machine.

A. C. Powell, Syracuse, Rugg's Reaping and Mowing Machine.

E. Danford & Co., Geneva, Kane Co., Ill., Danford's Doubled Sickled Reaping and Mowing Machine; also entered by J. Rapalje & Co., Rochester.

A. J. Cook, Enon, Ohio, Reaping and Mowing Machine.

T. D. Burrall, Geneva, N. Y., Convertible Reaper and Grass Cutter.

Seymour & Morgan, Brockport, N. Y., New-York Reaper.

Aaron Palmer, Brockport, N. Y., Palmer's Self-Raking Reaper.

John S. Wright, Chicago, Ill., Atkins' Automaton Raker.

T. R. Hussey & Co., Auburn, Hussey's Reaper.

O. Hussey, Baltimore, Hussey's Reaper and Mower.

*The inhabitants of Geneva were represented by a committee consisting of

JOHN H. TILLMAN, *Treasurer,*

Wm. Creighton Lee,

Wm. Orton,

E. Jenkins Burrall,

S. H. Parker,

JOHN C. PROUTY, *Chairman,*

A. T. CHEW, *Secretary,*

John L. Bennett,

S. C. Cleaveland,

Robert Lay,

Asa Gardner,

Jos. S. Lewis.

Mowing Machines.

Howard & Co., Buffalo, N. Y., Ketchum's Mowing Machine.
 T. Rush Spencer, Geneva, Bronson Murray's Mowing Machine.
 C. H. McCormick, Chicago, Ill., Mowing Machine.
 A. C. Powell, Syracuse, Rugg's Mowing Machine.
 T. D. Burrall, Geneva, Grass Cutter.
 J. H. Manny, Wadham's Grove, Ill., Mowing Machine.
 O. Hussey, Baltimore, Md., Mowing Machine.

Grain Drills.

P. Seymour, East Bloomfield, 3 Grain Drills.
 Huffman & Bickford, Macedon, N. Y., 1 Grain Drill.
 Rapalje & Co., Rochester, N. Y., Wheat Drill.
 Foster, Jessup & Co., Palmyra, N. Y., 2 Grain Drills.
 S. M. Drake, Skaneateles, Gatling's Grain Drill.
 S. R. Tracy, Newark, 1 Drill.

Horse Power—Sweep or Lever.

J. A. Pitts, Buffalo, N. Y., Pitt's Lever Power.
 Eddy, Dyer & Co., Union Village, N. Y., Taplin's Circular Horse Power.
 Daniel Woodbury, Palmyra, N. Y., Lever Horse Power.
 B. H. Wakely, McLean, N. Y., Lever Horse Power.
 Hall & Thompson, Rochester, do do

Horse Power—Endless Chain or Railroad.

Emery & Co., Albany, Railroad Power.
 George Westinghouse, Central Bridge, N. Y., Horse Power.
 Ezra W. Badger, Fly Creek, N. Y., one and two Horse Power.
 J. A. Pitts, Buffalo, N. Y., Horse Power.
 J. Rapalje & Co., Rochester, do
 Geo. F. Jerome, Hempsted, do

Iron Horse Power.

John A. Pitts, Buffalo, Iron Horse Power.

Thrashers.

Emery & Co., Albany, Thrasher and Separator.
 Eddy & Co., Union Village, Thrasher.
 J. A. Pitts, Buffalo, Thrasher and Separator.
 Daniel Woodbury, Thrasher and Separator.

George Westinghouse, Central Bridge, overshot Thrasher and Separator.
 Ezra W. Badger, Fly Creek, Thrasher and Separator.
 J. Rapalje & Co., Rochester, Thrasher and Separator.
 Harris Scovill, Tompkins Co., Thrasher.

Steam Engine for Farm Purposes, &c.

Hoard & Bradford, Watertown, N. Y., Portable Steam Engine.

Seed Planter, for Horse or Hand Power.

Emery & Co., Albany, Seed Planter.
 C. C. Van Every, Victor, Corn and Bean Planter.
 Pierrepont Seymour, East Bloomfield, two Seed Planters.
 Rapalje & Co., Rochester, two Planters.
 Foster, Jessup & Co., Palmyra, Corn Planter.
 John Woodward, New Hampshire, Corn Planter and Manure Depositor.

Cultivator for General Purposes.

Pierrepont Seymour, East Bloomfield, enters Horse Cultivator.
 Rapalje & Co., Rochester, 4 Cultivators.
 L. L. Whitbeck, Arcadia, 1 do
 S. R. Tracy, Newark, 1 do
 Killam & Valteau, Rochester, 1 do
 Bradley's & Roman's, do 1 do
 J. W. Hamilton, do 1 do
 H. H. Howe, Canandaigua, 1 do

Broad Cast Sowers.

Pierrepont Seymour, East Bloomfield, two Broad Cast Sowing Machines.

Early on the morning of Tuesday, the 20th of July, the marshal (Wm. Johnson, Esq., of Ontario,) announced that the Mowing Machines were on the ground, ready for trial. Numbers corresponding with the lots surveyed and marked on the meadow, were drawn by the exhibitors, and each machine was directed to its station according to the number drawn.

A view of the field at this time, with the array of Mowing Machines of varied construction, claiming to save labor, and accomplish better work than had hitherto been effected by the farmer, presented a scene of interest, not only to the agriculturist and mechanic, but also to every man whose views extended to the advancement of his State and of the nation. It could not escape

the observing mind, that, in this State, producing annually about *four millions* of tons of hay, there was on that field machines having the capacity to add, by their use, an annual income to the farming population of more than a million of dollars; and extending these views beyond the limits of our State, applying them to the Union, whose surface gives annually more than *thirteen millions* of tons of hay, how important becomes the investigation of this class of machines, thereby exhibiting to the agriculturist their powers, uses, and advantages.*

The duty of the judges might have been confined strictly and fairly to a report of the successful machines, yet as agricultural machinery may be esteemed as being in its youth, immature, as ingenuity and skill stamped their features on most of the machines presented, it seems alike due to the mechanic and farmer, to present a notice of the *unsuccessful* as well as of the more favored machines.

The annexed table exhibits, in a condensed form, the distinctive characteristics of the several Mowing Machines, and embodies the essential facts needful for a generally correct estimate of their respective merits:

* Estimating the hay crop of the United States, as per the census of 1850, at 13,605,384 tons, the average cost of cutting and making at \$1 per ton, and the saving, by use of Mowing Machines, at one-fourth of the present cost, the annual gain would be \$3,401,346.

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No. 1.	Rugg's	2	3	logged frequently.
2.	J. H. M.		4	logged twice.
3.	Ketchu	6	4	o interruption.
4.	C. H. M	6	3	logged frequently.
5.	Danfor...	...	...	logged frequently.
6.	T. D. I...	...	4	logged frequently.
7.	B. Mu...	...	4	logged frequently.

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STATEMENT

Of the Trial of MOWING MACHINES, at Geneva, July, 1852.

PATENTEES.	EXHIBITOR, OR AGENT.	POWER REQUIRED.				SPEED.				DRAFT.		KNIVES.					QUALITY OF THE WORK.							
		Price.	Weight.	Mph.	Horses.	Diameter of the Driving Wheel.	Circumference of Driving Wheel.	Revolutions of the Driving Wheel per minute.	Advance of the Machine per minute.	Time consumed in cutting two acres.	Absolute Draft.	Corrected Draft, assuming pounds per inch of the width cut.	Width at the base.	Length from the base to the apex.	Edge of the Knives.	Height of the Cutting Bar and Knives above the ground.	Length of the Wheel.	Number of vibrations to one revolution of the Driving Wheel.	Width of the Swath.	Diameter of the Roll.	Quality of the work, assuming fully perfect, and twelve-fifths as perfect work of the scythe.	Condition of the grass when cut.	Average length of the stubble.	
		Dollars.	Pounds.			Inches.	Inches.		Feet.	Hrs. Min.	Pounds.	Pounds.	Inches.	Inches.	Inches.	Inches.		Feet.	Feet.	Average.		Inches.		
No. 1.	Rugg's, ... A. C. Powell, ...	130	900	1	2	48	150	16	201	2.32	350	1.5	4	1½	Sickle.	2½	1	30	6.6	5.0	17	Fair.	5	Clogged frequently.
2.	J. H. Manny's, . . . J. H. Manny, ...	100	800	1	2	30	94½	32	251	....	400	6.1	4½	2	Sickle.	2½	4	30	6.6	4.6	34	Good.	2½	Clogged twice.
3.	Ketchum's, ... Howard & Co., ...	110	736	1	2	36	113½	20	188	1.26	450	8.0	3	3	Smooth.	2½	4½	36	4.8	None.	33	Good.	3½	No interruption.
4.	C. H. McCormick, . . C. H. McCormick, . .	100	800	1	2	28	88	34	247	0.56	330	4.8	4½	0	Sickle.	2½	4½	22	6.0	6.0	16½	Good.	5	Clogged frequently.
5.	Danford & Co., . . . Rapalje & Co.,* . . . .	.....	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	Fair.	.....	Clogged frequently.
6.	T. D. Burrall, ... T. D. Burrall, ...	100	750	1	2	38	119	25	248	.....	430	7.9	3	2½	Smooth.	1½	8	24	.....	None.	20	Good.	3½	Clogged frequently.
7.	B. Murray, ... Thos. R. Spencer, . . .	100	800	1	2	32	100	27	226	.....	430	7.2	3½	1½	Sickle.	2½	4½	20	.....	None.	17	Good.	4½	Clogged frequently.

* This Machine was not presented until the second day of Trial, at a late hour.



It will be perceived, from the data set forth in this table, that the chief competition rested between Manny, No. 2, and Ketchum, No. 3.

The judges did not feel entirely satisfied with the trial thus far, as the grass did not present the resistance to be encountered in average crops. The exhibitors were notified to present their machines on the following morning at 8 o'clock on the farm of Mr. Sherman, when a second trial would be made in heavy grass. At the appointed hour the judges were on the ground, and caused each machine to take its station as it arrived and was adjusted.

The KETCHUM MOWER led off handsomely, opening a double swath.

MANNY'S MOWER entered in the same manner and opened a double swath. So well was the grass cut by both machines, that no decided preference could be given to either—and it was manifest that no labor with a scythe could perform the work as well.

Both machines then entered upon the low grounds, encountering high and thick grass, portions being lodged and tangled, lying in all directions; they were directed to cut double swaths through this grass, and then to follow each other laying their swaths side by side. Ketchum's machine performed the task without interruption; Manny's machine was stopped by cutting through a hummock, which, lodging on the knives, pressed down the standing grass, preventing a free cutting action; a second interruption occurred when entering the swath, from inattention to clearing the cutting knives. Aside from these casualties the work was well performed.

The quality of the work accomplished by both machines could not fail to satisfy any farmer, and was better done than could be performed by the most expert mower with a scythe.

MANNY'S MACHINE is peculiar in its construction, by a facility of raising or depressing the cutting apparatus while in motion, at the pleasure of the driver, giving to it the capability of cutting the heads of grasses for seed, and afterwards the straw or stems and leaves for fodder; it runs on wheels; is easily moved from place to place; is strongly braced, and by an ingenious arrangement is capable of being contracted into a small compass for housing when not in use. Another peculiarity common to both Mr. Manny's and Mr. Murray's knives, is a cutting edge at the base, intended to prevent clogging. A reel is used with this machine,

which has a tendency to lay the grass in waves, and not of uniform thickness over the surface of the field.

KETCHUM'S MACHINE is remarkable for its compactness and simplicity of construction, also for the perforation of the knives, which, it is claimed, renders it impossible to clog in the cutting operation; the knives cut with a blunt edge at this perforation, necessarily consuming more power to effect the object than if it be a sharp edge. A curved iron elbow connects the knife or cutter bar with the running parts of the machine, bringing the knives close to the ground. It needs perhaps more strength and uniformity in mechanism—it works without a reel, performing its work admirably.

MCCORMICK'S MACHINE cuts with knives of a peculiar form, being broad at the base, short in length and having a *sickle* edge working between spear shaped teeth or fingers. The construction of this machine is too fragile for useful purposes, the knives yielded after a few swaths were cut, needing to be replaced by another set; these yielded also. The stubble was left long and uneven.

BURRALL'S MACHINE was presented for trial direct from the workshop, and now first subjected to its intended work. It is ingenious in mechanism, presenting a longer vibration of the cutting knives than any other machine; a fly wheel is attached to overcome variable resistances and equalize movements, and certainly the Burrall Machine moved over the ground with less noise and more smoothly than any other subjected to trial.

Without pretending to question the theory, it seems at first sight that a wheel of so small diameter and weight, could not efficiently or profitably collect power sufficient to overcome any sudden resistance to which a mowing machine is usually liable; certainly at this trial it did not prevent very frequent interruptions to its progress. More experience may show the value of this appendage. The ingenuity and excellent workmanship of this machine is worthy of high commendation, and we cannot doubt that under improvements which the present trials will suggest to the proprietor, he will at an early day perfect a Mowing Machine to stand in the foremost rank. In its present condition it choked frequently and needed oft adjustment.

MURRAY'S MACHINE arrived at the trial grounds from Illinois at the close of the day ; it was not properly adjusted for work, and no one conversant with its use was present to work it. Under these circumstances the work was badly done.

There are however in this machine points of ingenuity and excellence of arrangement which will probably place it when perfected among the favored implements of the agriculturist.

RUGG'S PATENT MOWER retains in a great degree the form of the earliest Reaping Machine as patented by the Rev. P. Bell in England ; the horses are attached to the rear of the machine propelling it, while the driver guides it by a steering wheel ; he can also elevate or depress the cutting knives at his pleasure. The advantages claimed for this patent were not apparent and the machine soon ceased to operate.

DANFORD & Co's MACHINE was not in time for examination and trial on the first day, and when in operation on the morning of the second day, it was frequently impeded by clogging. The peculiar feature of this machine is the reciprocating action of the cutting knives ; they are moved by eccentrics, causing the knives to pass each other in close contact on the same plane, the action of the blade therefore is like that of shears. This position of the knife cannot probably maintain a long continued perfect action, for as soon as the knives from any cause lose their sharp edge, the tougher grasses will be drawn between the plates, and by clogging arrest the progress of the machine.

The excellence discernable in the best Mowing Machines now exhibited, leaves no doubt as to their utility. It is equally clear that the work performed is far better than can be done by manual labor with a scythe.

The farmer will, however, need the occasional use of the scythe ; for neatness and thorough husbandry will claim the scythe to trim fence corners, to remove baulks occasioned by careless driving, as well as herbage which may escape the machine when passing stumps or rocks.

The economy derived from their use may be understood from the following computation :

An able man can cut with a scythe an area of one acre and a quarter each day, on a meadow covered with grass equal to two

tons per acre ; of heavy clover he will cut not to exceed one acre per day ; a few men can accomplish more than above stated, but on an average these quantities are found to be a full days work.

The rate of wages varies in different places and counties, yet a fair average rate of compensation in Central New York for men engaged in the hay harvest is seventy-five cents per day, or eighty cents per acre by the job, with their board and lodging.

Assuming the cost of cutting and making hay at one dollar per day for each man employed, we may approximate closely to the advantages of Mowing Machines. Thus

One acre of meadow grass yielding two tons will
cost for cutting and making the hay \$ 2 00

A field of ten acres will therefore cost 20 00

A Mowing Machine will cut an acre per hour, worked by one man with two horses ; a field of ten acres may be conveniently cut in one day by the machine ; three additional laborers will be sufficient and ample for turning, raking and cocking the ten acres.

Then the labor of the 4 men is equal to \$4 00

1 team, say, ... 1 50

Int. on cost of the machine—wear and tear, say 15
per cent per annum, to sink the cost in ten years,
\$15 ; this amount divided equally to ten harvest
days is equal to a daily charge of* 1 50

Cost of cutting and making ten acres of hay, of two ———
tons per acre by a machine, ... \$7 00

The difference in favor of the Mowing Machine is therefore a saving of labor equal in value to *thirteen dollars* per day, and upon every ten acres of grass land, the gain upon each ton is sixty-five cents.

Attention is thus drawn to the economy of Mowing Machines, that all interested may make estimates for themselves based upon wages and compensation directly applicable to their own locality, the above rates being adopted from the customs and practices of many farmers in the center of the State.

REAPING MACHINES.

A few years have passed since Reaping Machines were successfully introduced into the State of New-York. Since their intro-

* No estimate is made of the wear and tear of scythes, snaths, &c.

duction they have multiplied greatly in the grain-growing districts. Year after year, ingenuity, stimulated by demand, has attempted improvements, and as a measure of the excitement, it may be stated that *fifteen* patents were issued from the government office for Reaping Machines in the year 1850—'51.

These Reaping Machines are not confined as heretofore, to the cutting of wheat, barley and oats: they are constructed for harvesting Indian corn, stripping the ears from the stalks; for cutting or removing the corn stalks; also for harvesting cotton stalks, hemp and grasses.

The astonishment felt and expressed by British cultivators when two American reapers successfully laid the grain of their rich fields in regular gavels, ready for binding, at the rate of 15 to 17 acres per day, is generally known; and it appears by recent papers from England, that during the period while the Geneva trials were in progress, *seventeen* specimens of reapers were on exhibition at a meeting of the Royal Agricultural Society at Lewes; upon which occasion an American reaper is declared to have demonstrated its superiority over other similar machines.

It appears that British mechanics are adopting and combining the excellencies of various American reapers, producing results which are spoken of as producing a revolution in their harvesting operations.

This combination of American ingenuity obtained the silver medal of the Royal Society at their recent meeting, and it is said that more than one thousand of these machines have been made to order.

If then the farmers of the old world feel so much interest in agricultural machines in use among American farmers, we are at no loss to account for the excitement exhibited by New-York farmers and others visiting the Geneva trials.

Twelve grain Reaping Machines were entered for trial: three of them did not reach Geneva until after the adjournment of the judges.

The following table presents a list of the Reapers on the field, in the order of numbers drawn by them respectively, for their stations on the ground.

This table exhibits the action and main features of construction of each machine on the wheat field.

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QUALITY OF THE WORK.

No.	Advance per minute during the whole cutting.		Width at the base.	Quality of the work, 50 being perfect, and 25 the work of a cradle.		Condition of the stubble.
	Feet.	nds.	Inches			
1. C. H.			4	30	good.	good.
2. T. D.	101	21	3	33	good.	good.
3. Atkins	103	66	3			
4. E. Dan			2		fair.	good.
5. Seymo		5	4	29	good.	good.
6. J. H.	153	.91	4	31 $\frac{1}{2}$	uneven.	good.
7. Rugg's	103	.6	4	15		
8. O. Hus			4	31	fair.	good.
9. B. Der	99	.82	4	25	bad.	uneven.
10. A. J.	113	.83				
11. A. Pal						
12. Obed						

TABULAR STATEMENT Of the Trial of REAPING MACHINES, at Geneva, July, 1852.

PATENTEE.	Exhibitor or Agent	POWER REQUIRED.		SPEED.					DRAFT.		KNIVES.					QUALITY OF THE WORK.								
				Diameter of the vine wheel.	Revolutions of the drive ing wheel per mi- nute.†	Advance of the ma- chine per minute.†	Time consumed in cut- ting two acres.	Advance per minute during the whole cutting.			Absolute draft.	Corrected draft, giv- ing pounds per inch of the cut.	Width at the base.	Length, from the base to the apex.	Edge of the knives.	Length of the vibra- tion.	Number of vibrations to cut a foot of the driving wheel.	Width of the swath.	Diameter of the reel.	Mode of delivery.	Quality of the work, being perfect, and the work of a cr- d.	Condition of the gravel.	Condition of the stub- ble.	
		Dollars.	Penns.						Inches.	Feet.														Hrs. Min.
No. 1.	C. H. McCormick,...	C. H. McCormick,...	130	900	2	2	28	36	264	2.23	101	375	5.21	1 1/2	0 1/2	sickle.	5 1/2	32	6	6	side.	30	good.	good.
2.	T. D. Burrall,.....	T. D. Burrall,.....	120	1,000	2	2	38	26	258	2.18	103	100	6.66	3	3 1/2	smooth.	8	26	5	none.	side or back.	33	good.	good.
3.	Atkins,.....	J. S. Wright,.....	150	1,246	1	2	18	.....	.....	.....	.....	.....	.....	3	3	smooth.	5	30	5	.....	side.	.....	.....	.....
4.	E. Danford,.....	E. Danford & Co.,...	120	1,000	2	2	30	22	172	.....	.....	100	6.5	2 1/2	2 1/2	smooth.	5	32	5.6	5	back.	29	fair.	good.
5.	Seymour & Morgan,...	Seymour & Morgan,...	105	920	2	2	36	20	188	1.35	153	125	5.91	1	1 1/2	sickle.	4	30	6	6	side.	29	good.	good.
6.	J. H. Manney,.....	J. H. Manney,.....	105	840	2	2	30	23	180	2.31	103	100	6.6	1 1/2	2	sickle.	4	30	5.6	5	side.	31 1/2	uneven.	good.
7.	Rugg's Patent,.....	A. C. Powell,.....	125	920	2	2	48	.....	.....	.....	.....	1	1 1/2	1	1 1/2	sickle.	4	.....	6.6	5	side.	15	.....	.....
8.	O. Hussey,.....	T. R. Hussey,.....	135	925	2	2	12	29	319	2.39	99	150	6.82	1	3	smooth.	3	26	5.6	none.	back.	31	fair.	good.
9.	B. Densmore,.....	Byron Densmore,...	130	980	1	2	16	19	229	2.08	103	120	5.83	1	1 1/2	sickle.	4	24	6	6	side.	25	bad.	uneven.
10.	A. J. Cook,*.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
11.	A. Palmer,*.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12.	Obed Hussey,*.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* These Machines did not arrive in time for the trial.

† Stated and required by the exhibitors.



1. **MCCORMICK'S MACHINE** cut the wheat straw with accuracy, and called forth commendation at its first movement: the entire lot was not however cut evenly. In the barley field it did not work to advantage, particularly in the lodged grain; the gavels were well laid; during the action of the machine the horses were subjected to a heavy side draft.

With various and many good points, this machine has to contend with inferior workmanship and want of firmness.

2. **T. D. BURRALL'S MACHINE** performed its work in the most admirable manner; the gavels were well laid, though from the manner of delivery at the side a twist was observable: the workmanship and materials were excellent: the circular apron for side delivery—the balance wheel—and an arrangement to elevate the exterior edge of the apron, are valuable features.

3. **ATKINS' AUTOMATON MACHINE**, entered by Mr. J. S. Wright attracted much notice, not for the work performed, that was indifferent; but for the ingenuity displayed in the mechanism, whereby an arm was made to rise from the machine, descending with a rapid motion, it seized the cut grain on the platform, carried it to the side of the machine, and laid it in a tolerably well formed gavel, beyond the track of the reaper; this action was repeated in measured intervals proportioned to the advance of the machine, and deposit of grain on the platform.

It is due to Mr. Atkins, the inventor, to state that he is a cripple, and was confined to his bed during the whole period occupied by his men in the construction of this machine; in pain and sickness he conceived the design for a Self Raking Reaper; his instructions were carried out imperfectly in the selection of materials and distribution of strength; the absence of the master mind permitted errors of adjustment and arrangement, consequently it yielded in various parts during the trial. Yet when in motion, the action of the human arm and hand did not fail to find a surprising imitation in this ingenious machine.

Upon this occasion the inventor was largely indebted to Mr. Wright, for his indefatigable efforts to remedy the many difficulties arising from mal-construction—difficulties which may be easily obviated, because they are due to the builder and not to the inventor. These remarks upon an imperfect machine are

due to the inventor and to our agricultural interests, for it seems to contain the germ of one of the most useful implements which mechanical ingenuity can present to the farmer.

4. DANFORD & Co.'s MACHINE.—This machine has the peculiar arrangement of the knives described under the division of mowing machines ; the edges of the knives cut against each other, acting like scissors or shears. It performed the cutting satisfactorily ; yet the position of the knives, as now arranged, presents a formidable difficulty in a liability to clog as soon as their keen edge is lost. The motion of the wheel was not duly adjusted, a too rapid motion beat the grain and scattered it along the track : the workmanship of this machine was admirable.

5. SEYMOUR AND MORGAN's MACHINE.—The work was well done, the gavels well laid ; the draft was light and of rapid speed, but it is liable to the objection of side draft.

6. J. H. MANNY's MACHINE.—This Reaper cut admirably in wheat and barley ; the merits of construction were manifest in the barley field, where the driver could raise or depress the knives as the standing or lodged grain might demand ; the water courses also were easily passed ; these are valuable features.

The delivery is not perfect, owing to an elevation of the apron or platform which rises about eight inches above its lowest plane. The necessary consequence is, an uneven or disturbed condition of the gavels.

7. RUGG's MACHINE.—Having cut a portion of grain appropriated for the trial, was withdrawn.

8. T. R. HUSSEY's MACHINE.—A compact well built machine, cuts well except where the grain was thin, in such places it overrode the grain which escaped the knife. The gavels were tolerably laid. The construction of this reaper avoids all side draft ; yet the direct draft, as indicated by the Dynamometer, was greater than any other machine.

9. DENSMORE's MACHINE.—This is an ingenious self-raker, the grain being swept from the platform by fingers, with a motion more rapid as it passes the center of it, throwing the gavel from the side. The driver has the power of regulating this action by

his foot gathering more or less grain into a gavel, at his option. This clever machine seems not yet perfected, the stubble is left uneven, and the gavels are not smoothly laid for binding. In this machine may be seen the useful efforts of genius struggling to surmount difficulties, and it seems to present an object where success is within reach.

Numbers 10, 11 and 12 did not arrive in due season for trial. The machine of Mr. Obed Hussey, of Baltimore, reached the depot at Geneva the day after adjournment.

The established principle in the science of mechanics in regard to cutting tools, that an acute angle is the most effective on substances of woody fibre, seems to hold good in the form of a reaper knife; this is apparent upon comparing the angles of the several knives, as for instance the height of Mr. McCormick's knife from its base line to the apex is five-eighths of an inch, the base line being $4\frac{3}{4}$ inches; the power required to cut a swarth six feet wide, advancing at the rate of 101 feet per minute, was five pounds $\frac{3}{4}$ for every inch in width of the swath. The height of Mr. Burrall's knife above the base is $3\frac{1}{2}$ inches, the base being 3 inches; in this case the power consumed to advance 103 feet in a minute, is six pounds $\frac{6}{10}$, the swath being five feet wide.

The grain grower must not yet expect to be entirely independent of the cradle; for the tracks and avenues must be opened in grain fields for the entrance of reaping machines, as well as to remove occasional baulks, or the grain protected from the knife by large stones or tree stumps.

The advantage obtained by the use of Reaping Machines, will appear from the following comparative estimate of manual and machine labor:

Wheat yielding thirty bushels per acre can be cradled at the rate of two acres per day by an expert cradler, and few men can cradle more than three acres of oats or barley in a day. Rye will require more time than wheat, yet in this estimate it may be classed with wheat.

NOTE.—In nearly all the Reapers presented for trial, a decided improvement was exhibited in workmanship; there was a finish in many which may be viewed generally as proof of durability; a symmetry of form, and beautiful correspondence of various parts, were observable in the best machines. In others, coarse rough work dimmed and obscured their excellences, and caused defects, where existing mechanical *principles* indicated better results.

Farmers may differ in these estimates, but it is believed the number who can cradle the acres named, include the great mass of men; those who can exceed the spaces here adopted are few, and form the exceptions only to a general rule.

The average value of cradling labor is one dollar and a half per day with board and lodging, engaged for the harvest season. Job work costs about one dollar per acre. At this last rate, a field of fifteen acres will cost for cradling only, the sum of *fifteen dollars*.

The expense of reaping the same area by a machine, may be thus estimated :

A team and driver, ...	\$1 75
A man to rake off the grain, ...	1 00
Interest on cost of the machine at a value of \$120, and at 10 per cent to cover wear, is \$12, one-quarter of this sum applied to wheat, the balance to be divided among other crops, gives	3 00
	\$5 75

The cost of cutting fifteen acres of wheat in one day is \$5.75; which exhibits a saving of \$9 $\frac{25}{100}$ in favor of the reaping machine on an area of fifteen acres.

It must be evident that to accomplish the cutting of these 15 acres with cradles, in one day, seven men at least must be employed, and as many more to bind the grain into sheaves—making a force of 14 or more men. The machine requires two men to control it, and needs 7 or at most 8 men to rake and bind the grain, and shock the whole in the same day, making a further advantage by saving the labor of four men : equal to four dollars. Thus it appears that the Reaping Machine offers a considerable advantage over manual labor, say to the extent of \$13.25 on every 15 acres, or 88 $\frac{1}{3}$ cents per acre.

The number of acres appropriated to the culture of wheat in this State during the year 1844—'45, according to the State census, was 1,013,665. The census of the United States for 1850, shows a diminution of the wheat crop in this State; yet in the absence of sufficient official returns, we may reasonably assume the number of acres of wheat as being equal now, to the area cultivated in 1845. If so, it will be seen that the use of Reaping

Machines applied to the whole crop, would effect a saving to the State of about \$89,540 dollars per annum.

These estimates are presented with the intent to draw the attention of cultivators to the economy of machinery, and to invite every person interested in the inquiry to a more minute investigation for himself.

DRILLS.

The practice of sowing and planting seeds in regular rows or drills, has found so many advocates in the United States, as to encourage mechanical ingenuity in the attempt to improve machines derived from English and Scotch cultivators. Until within a short period, the Drill Machines have been cumbrous, and uncertain in the performance of the work desired; hence their use was for a long time confined to sowing the seeds of vegetables, and small areas of corn. Many successful trials with improved drills led to the construction of a very good machine by Pennock, of Pennsylvania, by which wheat was deposited in the earth with regularity and at uniform depth; it planted corn also when desired at equal distances; the use of this machine gave an impetus to drill husbandry, inducing the belief of utility and economy.

The advantages claimed for these machines, are:

1. Regularity in delivery of the seed.
2. It is deposited at the proper depth.
3. Facility of destroying weeds during the growth of the plant.
4. No loss of nutriment by feeding weeds.
5. Free admission of sun and air.
6. Economy of seed.
7. Less loss from winter killed grain.

These and other advantages are strongly claimed, probably upon insufficient proof for adoption in all the States of the Union. Yet it cannot be reasonably doubted that in the soil of the U. S., covering an area of one hundred and eighty-four millions of acres of improved fields, large tracts can be economically seeded by well constructed drills, especially in the corn growing regions, and wherever the cost of labor will permit the careful farmer to eradicate weeds from his wheat fields.

Recent improvements in this department of agricultural mechanics, have brought into use several machines, simple in construction, more perfect in their performance, and less expensive in cost than the complex drills of other days. Such is the character of the Drill Machines presented for trial to your committee, to whom it seems evident that the simplicity of construction now achieved has reduced the application of physical effort, and the liability to become deranged or worn; this improvement, though last named, is not inferior in importance to many others, as it too often has tested severely the patience of the farmer, when the aid of the mechanic is needed by repeated demands during the planting of a crop.

The following table contains such facts as could be derived during the investigation and trial. The work performed by the various drills was upon ground very imperfectly plowed, and upon which neither harrows or cultivators had much effect; consequently the drills were in action upon a soil in which no farmer would permit grain to be deposited.

The field was visited for examination on the 13th of August, being 20 days after the trial of the drills, when, in no instance could a perfect drill or row of grain be discovered; in fact, two thirds or more of all the seed drilled by each machine had perished. The failure in this respect is not attributable to the drill machines, but to the imperfectly tilled ground, and a continued drought from the day of seeding until the 20th of August.

STATEMENT

Of the Trial of Drills, at Geneva, July, 1852.

PATENTTEE.	Exhibitor.	Price.	Weight.	Rows of tubes	Number of drills.	Distance apart.	Draft in pounds	Depth of the seeds deposited.		POWER.		Delivery.
								Inches.	Pounds.	Men.	Horses.	
No. 1. Slipton, ...	Rapalje & Co., ...	\$70	....	1	7	9	305	2		1	2	imperfect.
2. Foster, Jessup & Co....	Foster, Jessup & Co....	75	....	1 or 2	9	7	335	2 to 3		1	2	imperfect.
2. Bickford & Co., ...	Bickford & Co., .....	.....	....	1 or 2	9	8	400	2 to 5		1	2	good.
4. P. Seymour, ...	P. Seymour, No. 1, ..	95	....	1	9	8	310	1 to 3		1	2	steadily.
4. P. Seymour, ...	P. Seymour, No. 2, ..	80	....	2	9	8	310	1 to 3		1	2	good.
5. Ides, ...	S. R. Tracey, ...	75	....	2	9	7½	300	1 to 3		1	2	good.
6. Gatling, ...	S. M. Drake, ...	65	....	2	6	9	280	2		1	2	Screw and/or delivery.

The tubes may work in single or double rank.
The tubes may work in single or double rank.
Has a special manure-box attached.

SEED PLANTERS.

Planting Machines are closely allied to Drills ; the former being intended to deposit and establish in the soil various seeds at certain distances from each other, the latter intended chiefly for small grains, placed in the earth in close contiguity, and therefore the action may more properly be called sowing.

Many of the Grain Drills are convertible into Planters, and used as such ; and the Planters now under consideration are constructed for the deposit of small seeds also, though intended or used for the seed of esculent vegetables only.

Six competitors appeared in this class of machines, viz : Emery & Co., of Albany ; C. C. Van Every, of Victor, Ontario co. ; P. Seymour, of East Bloomfield, Ontario co., Rapelje & Co., of Rochester ; Foster, Jessup & Co., Palmyra, Wayne co. ; and John Woodward, of New Hampshire.

The Planter presented by EMERY & Co. has been used in this State during several years. Many acres of corn have been dropped in rows by it, each grain being placed from four to eight or ten inches apart ; when horse power is applied, this implement will plant seven or eight acres per day, the rows being usually three feet apart or more, as the proprietor may desire. All other seeds are deposited by this Planter, and when planted on small areas, hand labor only is necessary. The cost of this machine is \$14 to \$16. The mechanical construction might be improved, the frame and castings are generally too light for farm work.

The Planter offered by C. C. VAN EVERY, of Victor, plants two rows of any grain at the same time, the rows being three and a half feet asunder. The peculiar claim of this machine is, the capability of depositing seed in each row at any required distance apart, from $1\frac{1}{2}$ inches to $3\frac{1}{2}$ feet ; the widest distance making exact squares. There exists a simplicity of contrivance in this implement which promises well, inducing a belief that with more attention to workmanship, the inventor will present a useful labor saving machine to the farmer. The cost is stated to

be thirty dollars; it is worked by one horse and one man to guide it.

PIERPONT SEYMOUR, of East Bloomfield, entered a machine as a Seed Planter, which performs good work; yet as this machine acts as a Drill, it has been noticed in that division.

RAPALJE & Co., of Rochester, presented two Planters, one of which was Emery & Co's., or identical with a Planter offered by Emery & Co. some few years ago, for which he obtained a premium, and similar to the same machine offered by Emery & Co. for trial. A small Planter, fit only for garden purposes, was also exhibited by Rapalje & Co.; among horticulturists it would probably be esteemed, but its capacity is not adequate to a farmer's wants.

A Planter, patented by DICKEY, of Pennsylvania, was presented by FOSTER, JESUP & Co., of Palmyra, and so constructed as to drop three grains of corn at the distance of every eighteen inches. This instrument did not fulfil the claims made on its behalf; the cost is \$20.

WOODWARD'S PLANTER was introduced and excited much hope as appearing to combine almost every qualification for a useful planting implement. It was tried with corn on the surface and found to drop four grains with accuracy at equal distances of three feet.

Gypsum or plaster was then placed in a hopper next to the seed box; when in motion it dropped the corn with precision, and deposited about a gill of plaster on the corn.

This machine was then worked in a piece of plowed or cultivated ground and planted several rows; upon examination, and upon removing the earth, it was found that not more than five and never less than four grains were dropped with remarkable exactness in each specified distance. It was moved by one horse, guided by one man, it cleared away all lumps from the track or row, leaving a smooth surface on which and directly over the corn, was about one gill of plaster.

It seemed evident that no manual labor with a hoe, could perform work so well. An arrangement exists, but was not exhib-

ited for working two machines by one horse, thus planting two rows at once.

The cost of a single machine is \$20 ; when arranged for two rows the charge is \$30. Moveable cylinders are applied and so constructed as to plant every variety of seed down to the most minute in size.

A Machine for sowing *all* seeds and grains *broad cast*, was presented by PIERPONT SEYMOUR. It has been much improved since its first introduction a few years ago. The indexed arrangement for graduating the delivery is good ; the oscillating motion given to the shaft which distributes the seed is derived from the off wheel while a slower motion is given by the nigh wheel to metal levers when used for distributing plaster, bone dust, lime, ashes or any other special manures. Another excellent feature in this machine is the additional box from which clover or timothy seed can be equally distributed, while at the same time manures can be distributed from the larger box. Thus any combination of seeds and manures may be effected during the deposit of the seeds on the soil:

This implement is usually moved by one horse, the driver has a seat above the grain boxes, and it sows a breadth of ten feet.

The advantages of Drill Husbandry have not yet been decided, except only the evident benefit of weeding drilled fields by the hand or hoe. Broad Cast Sowing has prevailed throughout the world, and possesses the advantage of greater expedition, and as many believe a greater product from an acre, and grain of more uniform quality. The perfection to which both Drills and Broad Cast Sowers has arrived, must ere long settle the claim of preference among cautious observing farmers.

CULTIVATORS.

Instruments for stirring the surface of the earth have long been extensively used in the United States ; they were for a long time confined to the corn and potato crops, taking place of the plow for clearing or destroying weeds. Their form and mode of application were derived from the English grubber, scarifier and extirpator, neither of which were found sufficient for the desired

operations on the fields of this country. The corn cultivator maintains its place under many modifications, but the working of fallows has enlarged the cultivator of 1831 to an implement bearing a value about equi-distant between the plough and the harrow.

Eleven cultivators for general purposes were entered for trial ; among them was an implement presented by Mr. Howe, of Canandaigua, denominated "a field cultivator;" it has seven teeth in a square frame supported on wheels, these wheels are within the frame, permitting the teeth to cut about two inches in depth. It is a compact strong implement, the front teeth are set directly before the wheels ; a good arrangement, as it was evident the cultivator maintained a more steady course, the wheels running in the track of the teeth, and therefore less liable to be raised by lumps or other obstructions. An objection exists, however, to its action in the present mode of construction: it takes so slight a hold of the earth that it does not effectually disturb the grass and roots, neither did it work the entire surface over which it passed, leaving about one-fourth undisturbed ; nevertheless, there are merits in this machine which will probably lead to one of the most perfect of its class. The price is \$24. Draft is 350 pounds.

SEYMOUR'S WHEAT CULTIVATOR is an implement unused as yet by farmers, being now for the first time introduced. It consists of a set of 9 teeth applicable to his drill frame after removing the tubes, thus converting the wheat drill into a wheat cultivator intended to pass between the rows of drilled grain whenever a growth of weeds indicates a necessity for their removal, or it may be used for stirring the earth between the drills. The teeth are charged at \$10 for the set of nine. The draft of this implement is 300 pounds, and is drawn by two horses.

L. L. WHITEBECK, of Arcadia, presented his "Universal Plow." It is a light implement, consisting of three shovel shaped plows in a square frame, working the soil about $2\frac{1}{2}$ inches deep or more, according to the mellowness of the earth. It may work with advantage on light sand or loam soils, but can rarely be service-

able in the wheat soils. The draft was 230 pounds ; worked by one horse and a driver. The price is \$10.

IDES' PATENT CULTIVATOR was offered for trial by S. R. TRACY, of Newark, Wayne county. This implement has been extensively in use for several years ; it has 7 teeth 13 inches long below the beam ; this beam rests on wheels and so arranged as to be raised by levers, elevating the teeth above the surface of the earth, rendering its transportation from place to place as easy as any light two wheeled carriage ; the levers work in notches on cast iron ratchets whereby the teeth are elevated or depressed at the pleasure of the driver ; at this trial they worked at a depth of $2\frac{1}{2}$ inches, disturbing the whole surface to the width of the frame. The draft was not ascertained as no means existed for attaching the dynamometer. The price is \$30.

ROOT'S CULTIVATOR was introduced by RAPELJE & Co. This implement has seven teeth with steel edges on a strong cast iron shank twelve inches long ; the wheels are so disposed as not to incline the cutting edge of the teeth to hold firmly to the soil. The consequence was this cultivator did not perform its work well.

It was worked by two horses and a driver ; the draft indicated was 325 pounds—and the price was stated at \$28.

KILLAM & VALLEAU exhibited a Gang Plow which was entered in the class of Cultivators. This implement consists of a frame to which is firmly attached four small plows ; the frame is jointed and so constructed as to allow it to turn in a small compass, this is peculiar and well contrived. It is worked by three horses and a driver ; on trial the furrows were cut $2\frac{1}{2}$ inches deep, and nine inches wide ; the draft indicated was 450 pounds. The work performed was good, even and free from baulks.

This implement does not belong properly to the class of Cultivators, for upon a recently plowed field, the work would probably be ragged and imperfect, not stirred and mixed as by the usually formed cultivator teeth. It was regretted that no such ground could be had for a trial. The implement appeared how-

ever to possess so much merit as to need this notice ; the price is \$30.

In the construction of Cultivators a defect was observable in several, which doubtless was noticed by agricultural mechanics ; we allude to portions of surface soil in the track of the implements not stirred ; the edges of the cutting tooth made a concave excavation, leaving ridges between the concaves, reaching nearly to the surface. This defect was confined to a few only of the Cultivators presented for trial.

THRASHING MACHINES.

The early history of Agricultural Mechanics as applicable to the separation of the grain from the straw, has even now become a matter of speculative doubt and inquiry. Looking to southern Europe, it seems strange that science has not more decisively overthrown the system of thrashing by treading out the grain from the ear by the feet of cattle : this seems more strange when we know that, before or at the Christian era, thrashing was done not only by treading, or by the flail ; it was also performed by subjecting the sheaves of grain to "*a sharp threshing instrument having teeth*,"* which was something resembling a cart drawn over the grain by horses or oxen.

In northern Europe, where the arts and sciences have made great advances, we find even at this day, the early systems of thrashing, as practiced by the ancient Arabs, Syrians and Egyptians.

In this country, the feet of cattle and the flail gave way to well constructed and effective machines about twenty years ago. Since their introduction they have been steadily and quietly superseding the use of the flail, expelling its musical notes or exchanging them for the hum of the rapid-moving and toothed cylinder.

We see from the quotation above given that a toothed instrument was used for thrashing, two thousand years ago ; and it is claimed that the first thrashing machine of Great Britain was patented by Michael Menzies of East Lothian in 1732. This seems to have been the germ of modern thrashing machines, for

* Isaiah, 41 : 15.

it was not until the year 1786 that a successful thrashing machine was invented.

These historical memoranda are alluded to, that a fact connected with this country may be preserved among our farmers, as interesting, at least in connection with the advance of agricultural mechanics.

In the year 1650 a volume was published in London purporting to describe the *machinery* used by the planters and farmers of Virginia. This work was compiled by Ed. Williams, who states that a saw-mill was in operation, which he describes, and which could be easily converted "to thrashing wheat, breaking of hemp or flax."

No pretensions are or need be founded on this curious agricultural and historic fact, yet it shows that thrashing wheat by machinery was thought of in this country at a very early period.

It was hoped, and the endeavor of your committee has been, to test the comparative merits and excellences of the thrashing machines, with a close approximation to accuracy, by comparing the quantity of wheat obtained by each, from a given quantity of sheaves of grain. With this view, one hundred sheaves of wheat were appropriated to each competitor; each parcel was carefully weighed; and a weighed portion being submitted to the action of each machine, the following results were obtained:

EXHIBITORS.	Character of machine.	Weight of sheaves.	Number of sheaves.	Weight of cleaned wheat.	Ratio of wheat to straw.	Revolutions of cylinder while thrashing.	Time in minutes.	Number of horses.	Kind of power.	Number of men instead of horses.
Woodbury,.....	Separator and cleaner	861	100	137	15.9	1300	13	6	S.*	6
Scovill, ...	do	710	102	161	22.7	1700	5	8	S.	6
Westinghouse, ...	Separator,.....	954	103	200	20.9	1450	13	2	E. C.	5
Jerome,.....	do	489	50	85	17.4	1600	8	1	E. C.	4
Hall, ...	Separator and cleaner	1000	100	192	19.2	1650	8	8	S.	6
Badger, ...	Separator,.....	850	101	156	18.4	1600	17	2	E. C.	5
Eddy, ...	Thrasher only,.....	1080	100	174	16.1	1500	10	2	S.	5
Pitts, ...	Separator and cleaner	934	100	194	20.8	1350	5	8	S.	7
Emery, ...	Separator,.....	840	102	169	20.1	1550	10	2	E. C.	5

If the relation between the wheat and straw had been equal in the several parcels, the fifth column would have determined the comparative values of the machines so far as their ability to sepa

* In the 10th column S. means sweep principle, E. C. endless chain power.

rate all the grain was concerned. But throughout these trials the constant aim has been to avoid a reliance upon opinions: an earnest endeavor has been used to ascertain and record facts in relation to each machine with the nearest practicable approach to mathematical accuracy, and from such premises to determine merits and excellences.

It would mislead the farmers of this State, and do injustice to the inventors, if the results exhibited in the above table were allowed to stand as a correct exhibit of the ability of the several machines to separate the wheat from the straw.

It was obvious when inspecting the various parcels of wheat, that a difference existed with respect to the *quantity* of grain and straw in each; some were free from grass and weeds, while others were materially affected by them: another portion was much injured by the wheat fly or midge, while a part was free from this insect.

It seemed clear, therefore, that the table would present an imperfect test; an incidental occurrence proved the truth of this position. Messrs. Hall and Westinghouse were of opinion that their machines were not accurately tested in relation *to time*, and they were allowed to make a second trial. It was evident there could be no difference in the ability of each machine to thrash clean on the first and second trial, yet Westinghouse during his second trial obtained 164 pounds of wheat from 748 pounds of straw, equal to 21.9 per cent., and being one per cent. *more* than on his first trial; while Hall obtained 100 pounds of wheat from 1000 pounds of straw, equal to 10 per cent., being 3.2 per cent. *less* than on his first trial. Such discrepancies in machines when tried *against themselves* impair confidence in the test, although we obtain useful matter for judgment and establishing comparisons.

The following table brings to view various interesting particulars respecting the thrashing machines exhibited at Geneva:

	Length of cylinder.	Diameter of cylinder.	Weight of cylinder.	Weight of the machine.	Price.	Length of tooth.	Mash.	Motion.
	Inches.	Inches.	Pounds.	Pounds.	Dollars.	Inches.	Inches.	
Woodbury's, ..	32	15	204	1000	145	2 $\frac{1}{2}$	3-16	Undershot.
Seovill's, ...	32	14	180	1300	150	2	3-16	Undershot.
Westinghouse.	24	14	125	300	40	1 $\frac{3}{4}$	3-16	Overshot.
Jerome, ...	22	14	.....	300	35	1 $\frac{3}{4}$	3-16	Overshot.
Hall, ...	30	14	.....	1200	150	.....		Undershot.
Badger, ...	28	16	135	300	35	1 $\frac{3}{4}$		Undershot.
Eddy, ...	23	11 $\frac{1}{2}$	175	350	40	2		Undershot.
Pitts, ...	32	16	100	1200	150	2	.....	Undershot.
Emery, ...	26 $\frac{1}{2}$	14 $\frac{1}{2}$	110	400	35	1 $\frac{1}{2}$		Overshot.

These machines are so similar in their power of separating grain from straw, that any preference must arise from other considerations.

The cylinders all revolve at so high a rate of speed it becomes important to protect the journals from the gritty particles of dust which are always flying in profusion while thrashing: thorough lubrication is also essential. To secure these desirable ends, inventors have provided special contrivances; they cover the orifices for lubrication with close fitting tin covers to exclude grit and dust. In some instances a candlewick passes through a tube in the box which at one end touches the journal, and at the other communicates with a cup-shaped cavity on the box, filled with oil, from which cup it passes to the journal by capillary attraction. This contrivance was used by Westinghouse and worked well, while the machine was under examination. Tallow was used on Pitts' machine, being placed within a collar on the upper box, covered by the tin cap; a straw is thrust through the tallow to the journal. Through this hole thus made oil is poured for lubrication. If by neglect the supply of oil is deficient, the journal becomes heated, melting the tallow, and for the time perfect lubrication ensues. These contrivances are among the best presented, to guard against negligence; but the farmer must esteem them only as expedients never to be relied on for the preservation of his machinery: due attention and uniform application of substances to lessen friction, are not to be omitted with impunity.

Pitts' machine is furnished with an open cylinder: this is deemed objectionable as some of the heads of wheat or other

grain are lost by falling through the open spaces. This loss was particularly noticed when the Pitts machine was working with the endless chain power, at which time it was divested of the cleaning apparatus. When, however, the cleaning apparatus was attached, it made clean work, as the falling heads were carried back by elevators and thrashed over until they were clean. A marked difference in value exists, therefore, adverse to the use of open cylinders, unless accompanied by apparatus for re-conveying the loose-falling heads to the cylinder.

Westinghouse's cylinder moves upon steel journals; movable tin curtains are supplied to keep dust and stones from the face of the operator; in other respects there is little if any difference from other machines.

The plan and construction of Eddy & Co.'s machine recommend it for durability and ease of repair. The cylinder is formed by a series of iron rings on an iron shaft passing through their center; two wrought iron arms pass from near the center of each ring through the circumference, and by their projection beyond it, form the teeth of the cylinder, which is hollow, not liable to burst or fly apart, and in case of fracture may be repaired with great facility.

It will be noticed in the table that with the exception of Scovill's, Eddy's cylinder is the heaviest, and therefore at equal speed would have the greatest momentum, and if the resistance was uniform would absorb the most power: but in thrashing, when motion is obtained from horse power, the resistance is irregular, and we apprehend the weight of the cylinder will not in fact require more power, but in effect operate like a fly wheel equalizing motion.

The simplicity of construction of this machine, and its general excellence, obtained commendation from every member of the committee.

In relation to the teeth of cylinders, a difference of $\frac{3}{4}$ of an inch is observable in the various machines. (See the table.) No special difference in the performance of their work was observable, as derived from the length of the teeth; the prevailing opinion is therefore that the shortest are to be preferred, as by their smaller leverage they are less liable to fracture.

For many years grain was thrashed by portable machines and left in the chaff, to be cleaned at the convenience of the farmer. The inventive genius of our people next presented to the agriculturist a combination of parts whereby the grain was thrashed, winnowed, and delivered clean for the granary, at one operation.

These latter machines are fast increasing in number, and four of this class were presented for trial, while five simple thrashers were exhibited; all in competition for the same premiums. The class of thrashers with separators and cleaning apparatus, consisted of machines presented by Pitts, Scovill, Woodbury, and Hall. The simple thrashers were those of Emery, Westinghouse, Eddy, Badger and Jerome.

These distinct classes cannot be compared with each other: and your committee have viewed them as unconnected. The great difference in weight and cost of these classes is distinctly noticeable in the table.

For the purpose of comparing the cheapness of thrashing by these two classes, it may be assumed that 4500 sheaves (or any other number) is the average quantity of work per day for Pitts machine; and that 360 pounds of clean wheat is the yield from each 100 sheaves: these $\frac{360 \times 45}{100}$ gives 270 bushels of clean wheat per day. The machine requires eight horses at 50-100 per day each, and seven men at one dollar each, making an aggregate cost of \$11 per day, or 4 cents and 7 mills per bushel.

The table shows that Emery's machine requires twice the time to perform the same work that Pitts' machine will accomplish: therefore Emery will thrash 135 bushels per day. To perform this work Emery requires five men and two horses, the aggregate cost of which is, at rates before stated, \$6 per day, or 4 cents 44 mills per bushel.

The difference is 37 mills per bushel in favor of Pitts' machine, which is increased by whatever the cost may be of winnowing the grain thrashed by Emery's machine and left in the chaff. This difference will pay the extra interest on the cost of the larger machine, the expense of keeping it in repair, and the cost of an elevator to remove the straw to the stack yard.

These advantages belong alike to all the machines of the class of which Pitts' is the representative.

Not a particle of thrashed grain passed over with the straw of Pitts' thrasher, neither could any heads be found from which the grain was not thoroughly thrashed out. While, however, great and well deserved credit is due to this machine for thoroughness of work and its facilities for repair, it is to be regretted that more attention has not been given to durability and solidity of structure: it is worthy of the best workmanship, which in the specimen exhibited is in a ratio far below its merits.

The same negligence and inattention seems to prevail *generally* in machinery and implements for the farmer's use, inflicting serious injuries upon the cultivator, and discredit upon the mechanics who prepare them.

In Hall & Thompson's machine it was discovered that a little yet a very little wheat passed over with the straw; and the heads were not as perfectly thrashed as by Pitts'. Yet on the whole the performance was very satisfactory.

Woodbury's machine is novel in its construction, and the adjustment by which the horses can be stopped immediately is very useful in practice. The belt being carried above the horses relieves them from the necessity of stepping over it: it is very portable, but it did not thrash well—a constant stream of grain was passing over the apron with the straw, and the heads seemed imperfectly thrashed.

Scovell's machine also wasted the grain too much to be used with advantage.

In the class of Thrashing Machines without any cleaning apparatus, it has been remarked that but little actual difference existed in respect to the mere power of separating the grain from the straw: hence the chief difference between them is in durability, workmanship, power required to work them, and cost.

Emery & Co.'s machine is thoroughly built, the journals run in Babbett metal boxes, and consuming no more power than others of its class, has the advantage of economy in the first cost.

Badger's Thrasher and separator did not entirely fulfil the expectations formed by many. The differences, however, between this and the more perfect machines on the ground, need not prevent its use, for these differences are slight though palpably sufficient to make a discrimination.

HORSE POWERS—SWEEP OR LEVER.

The following table exhibits the most important facts in relation to Horse Powers on the sweep or lever principle.

	Pounds required to start the machine.	Revolutions of driving wheel to one sweep.	Revolutions of driving wheel per minute.	Pounds of traction to sustain the speed.	Diameter of the sweep in feet.	Price.		Revolution of hand wheel for each pound of traction.
						Dols.	Pounds.	
Eddy & Co. (iron,).....	18	82	255	16	20	.....	.....	15.94
Eddy & Co. (wood,).....	18	82	250	20	22	.....	.....	12.50
Woodbury,.....	54	125 $\frac{1}{2}$	212	30	20	.....	.....	.....
Wakeley,.....	50	.....	372	16	25	100	1,250	23.25
Pitts, (iron,).....	54	200	550	30	23 2-12	100	.....	18.33
Pitts, (wood,).....	54	200	610	30	24	100	7,200	20.33
Seovell,.....	.....	.....	.....	.....	.....	.....	.....	.....
Hall & Co.,.....	.....	.....	.....	.....	.....	.....	1,000	.....

The data in this table show that the greatest effect produced by a given draft is by the Wakeley power: in other respects also, this seems to be a good machine. It is constructed on what has been termed the "sun and planet system"; the teeth are carefully formed, upon true principles; friction is reduced, and the workmanship throughout is substantial.

HORSE POWERS ON THE ENDLESS CHAIN PRINCIPLE.

In the absence of Dynamometers applicable to a determination of the force required for operating horse powers on the endless chain principle, your committee adopted the following plan:—Every platform on which the horses tread was elevated to form an angle of 13 degrees with a level base line; two men whose weights were ascertained, were placed on the platform, and the number of revolutions of the driving wheel derived from their gravity was ascertained by the speedometer; the length of platform required to make one revolution of the driver was carefully measured. From these data the length of platform passed over by the men in one minute was readily obtained, and with the

length of the platform and two angles being known, the elevation attained by the men in one minute, walking on the platform, was ascertained; or in other words, the height of a perpendicular line in the direction of which a weight would be raised, by a given power on an inclined plane.

With these facts carefully obtained and noted, the following results were ascertained, and are here exhibited in tabular form :

EXHIBITORS.	Revolutions of the band wheel in one minute.	Length of platform moved to produce one revolution of the band wheel.	Length of platform travelled over in one minute.	Number of feet raised perpendicularly in one minute.	Weight raised thro' perpendicular space.	Traction in lbs to start the mach. from a state of rest.	Weight placed on the platform.
		Inches.	Feet.	Feet.	Pounds.	Pounds.	Pounds.
Emery & Co., .	430	10 $\frac{3}{4}$	372	83.68	52.18	50	232
Westinghouse, .	386	7 $\frac{1}{2}$	229	51.51	52.18	54	232
Pitts, ...	205	14	239	53.76	52.18	42	232
Badger, ...	218	10	181	40.72	52.18	50	232

A second trial was made with these machines, placing six men on the platform, whose aggregate weight was 925 pounds. The thrashing machines were attached to the powers, and the following results obtained :

	Revolutions of the band wheel in one minute.	Length of platform moved to produce one revolution of the band wheel.	Length of platform travelled over in one minute.	Number of feet raised perpendicularly in one minute.	Weight raised thro' perpendicular space.	Weight of the six men.
Emery & Co., ...	240	10 $\frac{3}{4}$	207	46.56	208.80	925
Westinghouse, ...	256	7 $\frac{1}{2}$	152	34.19	208.80	925
Pitts, ...	91	14	106	23.84	208.80	925
Badger, ...	150	10	125	28.12	208.80	925

This test did not furnish a comparative value of the machines as close as desirable; for the thrashing machines attached to the powers were of various sizes, with unequal momenta, and subject to various degrees of friction.

The committee endeavored to correct this source of difference, at Utica, during the Fair, by testing each horse power with the same thrashing machine. Upon this occasion, five men, weighing in the aggregate 714 pounds, were placed on the platform of each machine, elevated as before to 13 degrees, and the following comparative results were obtained:

EXHIBITORS.	Revolutions of the driving or hand wheel.	Length of platform moved to produce one revolution of the driving wheel.	Number of feet travelled on the platform.	Perpendicular elevation.	Weight raised through the perpendicular space.	Revolutions of the cylinder.	Weight of the 5 men.
Emery & Co.,.....	259	10 $\frac{3}{8}$	224	50.39	160.62	1996	714
Westinghouse,.....	217	7 $\frac{1}{8}$	129	29.02	160.62	1390	714
Badger,.....	360	10	300	67.48	160.62	2160	714

Mr. Pitts was not present at Utica with his machine.

It is obvious from the foregoing tables, that Badger's machine works with the least friction ; or, in other words, gravity gives to his machine a greater amount of useful power than to either of the other machines on trial, having the advantage in regard to the revolutions of the cylinder of *seven and a half* per cent. over Emery & Co., and a still greater advantage over Westinghouse. In regard to the power exhibited by the weight descending the platform, it appears that the same weight moved Badger's platform 300 feet, and Emery & Co.'s 224 feet, the difference (76 feet) being 25 $\frac{1}{3}$ per cent. in favor of Badger's power.

Badger's power is well made, and in this respect deserves much credit ; yet in this excellence he is exceeded by Emery & Co. The platform of Badger's horse power rolls over friction wheels of unusually large diameter. It is a rack and pinion power, the lugs being connected by strong iron links, and the rack, though straight, is provided with teeth increasing in depth as they approach the exterior edges of the pieces into which it is divided, and is perforated in the center of each piece to accommodate the convexity of the pinion while passing over it. This perforation weakens the pieces and increases their liability to fracture ; from their structure, a rubbing action seems to be inevitable, causing rapid wear.

The platform of Emery & Co.'s power rolls over reels furnished with clutches so disposed that the action of the rods is ever nearly in a direction of a tangent to the circle, and therefore acts to the best advantage. This arrangement seems less liable to wear than any other, and the entire contrivance and perfection of the work gives to it a marked superiority.

Three one horse powers were next submitted for trial. Two men weighing together 317 $\frac{1}{2}$ pounds were placed on the platforms, and to each power was successively attached the same thrashing machine. The following results were obtained :

Emery & Co.	produced	950	revolutions of the cylinder.
Badger	"	630	"
Jerome	"	595	"

STEAM ENGINES FOR AGRICULTURAL PURPOSES.

One engine only for agricultural purposes was presented for trial. No sufficient arrangement could be conveniently made on the trial ground to secure the engine in a solid position and to avoid vibration; hence a difficulty occurred preventing the use of a dynamometer of rare excellence, procured from the Hadley Falls Company. Under these circumstances it was determined to have a more perfect trial of Messrs. Hoard & Bradford's portable steam engine, at Utica, during the week of the State Fair.

The attention of the Society and of farmers of this State has been invited to several attempts within a few past years to employ steam in the place of animals, as a motive power for thrashing, sawing, and all farm work which may be accomplished by fixed or portable engines. We are not informed that any farmer in this State has adopted them, though much interest has been felt in the improvement of engines and their nearer approach to perfection. Extended inquiries are necessary, and many well established evidences will be demanded to show that steam can be employed in our farm operations with economy, prudence and safety. The farmer will compare the cost of an engine, the fuel and wages for working it, with cost, food and care of horses: the wear of the engine must be computed, as well as the depreciation of animals by age and hard labor. It is not necessary to enter into these estimates now, yet they are mentioned to draw the attention of farmers to an auxiliary highly esteemed and extensively employed in other countries.

It is regretted that Messrs. Hoard & Bradford did not present their engine at Utica for further trial, as your committee was prepared to devote much time to its examination: they had purposed to lay before the farmers of New-York an account of existing improvements in this branch of agricultural machinery, as a motive power for their uses, and to have examined the comparative values of fuel whether of coals or wood; thus leading the mind to inquiries which at an early day will probably be forced upon our consideration. Messrs. H. & B. were prevented from attending by the sickness of the men in their employ.

Among other important questions, even now claiming our care,

is the relative value of portable and stationary powers. It is a question which should earnestly engage the consideration of the farmer who uses the power of horses with machinery, for it materially affects the economy of the farm, in the disposition of the buildings and various means for the protection of grain crops.

Knowing that steam power is employed in British husbandry, and that it is claimed to be a source of economy and profit, it seems to be a fair field for American enterprise and ingenuity, to seek a result as successful in the application of steam to farm labor, as has been achieved on our rivers, our roads, and on the ocean.

PRICES OF MACHINES.

Before closing this report your committee ask attention to the column of prices or marketable values, in the table, as declared by the several proprietors of machines presented for trial. It has long been a source of annoyance to the farmer to be urged and pressed to purchase agricultural machinery at exorbitant prices, under the plea that patent right expenses forbid a less selling price. But aside from all excuses thus offered, there is sound reason to believe that the farmer usually pays more than twenty-five per cent. beyond a *reasonable* compensation for the machinery purchased by him. To illustrate this position in part, your committee were informed by Manny, the proprietor of the Illinois patent adjustable reaper, that "his price in Illinois was \$135, but with increased facilities for manufacturing had reduced the price to \$125; and with far greater facilities for manufacturing here, (New-York,) materials being only about *one half the cost*, and *labor easier obtained and cheaper*, my price *here* would be reduced to \$100 without the platforms, and with three extra knives, with platforms, \$105. You will understand the machine exclusively for mowing, \$100; for mowing and reaping combined, \$105."

In addition to the foregoing there is reason to believe that these Illinois machines may be constructed for \$60 to \$75 each. We would by no means interfere with rights or privileges in any form; but we deem it a paramount duty to guard the interests of the farmer. When all parties are well informed in regard to

labor applied, and its *products in articles* not of agricultural origin, then demand and supply will fairly regulate each other.

The continued duties of your committee at Utica, in relation to the machines presented for trial at Geneva, prevented an examination of many excellent machines and implements presented at the annual fair: it was due to the exhibitors that a more extended notice should be taken of them, than could be accomplished. A roughly made grain reaper, and evidently a first experiment, attracted notice by the novel action of the knives; the blades forming a triangle, and the cutting edge inclining at an angle of about 40° with the base. These knives are attached to an endless chain, each one passing through a finger, against the edge of which it operates with an oblique or drawing motion. By this arrangement there is no vibration and no dead points to overcome. The base of the knife is $4\frac{1}{2}$ inches, the perpendicular being $3\frac{1}{2}$ inches; each blade moves 18 feet for every revolution of the driving wheel. There are points about this machine deserving encouragement.

We have thus presented such facts derived from the trials of Implements and Machinery, as will we trust meet the desired ends of the Executive Committee. We have combined therewith remarks which may not be deemed strictly relevant, yet they flow from the subjects treated, and may be acceptable and useful to the farmer, as well as conducive to our agricultural advancement.

After mature deliberation, we adjudge and award the premiums offered by the society, as follows:

A W A R D S

ON THE

Trial of Implements and Machinery at Geneva.

To T. D. BURRALL, of Geneva, New-York, for the best Grain Reaper—*Diploma* and \$50.

J. H. MANNY, of Wadham's Grove, Ill., for the second best Grain Reaper, (convertible for grass mowing)—\$30.

SEYMOUR & MORGAN, of Brockport, N. Y., for the third best Grain Reaper—\$20.

Mowing Machines.

J. H. MANNY, of Wadham's Grove, Ill., for the best Mowing Machine, (convertible for reaping)—*Diploma* and \$50.

HOWARD & Co., of Buffalo, New-York, for the second best Mowing Machine—\$30.

Grain Drills.

PIERPONT SEYMOUR, of East Bloomfield, Ontario Co., New-York, for the best Grain Drill—*Diploma* and \$25.

BICKFORD & HUFFMAN, of Wayne Co., New-York, for the second best Grain Drill—\$15.

S. R. TRACY, of Newark, Wayne Co., New-York, for the third best Grain Drill—\$10.

Horse Power, on the Lever Principle.

J. A. PITTS, of Buffalo, New-York, for the best Horse Power for general purposes—*Diploma* and \$25.

EDDY, DYER & Co., of Union Village, New-York, for the second best—\$15.

Horse Power, on the Endless-Chain Principle.

EMERY & Co., of Albany, New-York, for the best Horse Power, Endless Chain—*Diploma* and \$25.

E. W. BADGER, of Fly Creek, Otsego Co., New-York, for the second best—\$15.

Horse Power—Iron.

B. H. WAKELEY, of McLean, Tompkins Co., New-York, for the best Iron Horse Power—*Diploma* and \$25.

EDDY, DYER & Co., of Union Village, Washington Co., New-York, for the second best—\$15.

J. A. PITTS, of Buffalo, New-York, for the third best—\$10.

Thrashing Machines, with Cleaning Apparatus.

J. A. PITTS, of Buffalo, New-York, for the best Thrashing Machine, with Cleaning Apparatus—*Diploma* and \$10.

HALL & THOMPSON, of Rochester, New-York, for the second best—\$8.

Thrashing Machines, without Cleaning Apparatus.

EDDY, DYER & Co., of Union Village, Washington Co., New-York, for the best Thrashing Machine, without Cleaning Apparatus—\$10.

Seed Planters.

JOSHUA WOODWARD, of Haverhill, New Hampshire, for the best Seed Planter—*Diploma* and \$10.

Cultivators for general purposes.

S. R. TRACY, of Newark, Wayne Co., for the best Cultivator for general purposes—*Diploma* and \$10.

HENRY HOWE, of Canandaigua, Ontario Co., New-York, for the second best—\$8.

Broad Cast Sowers.

PIERPONT SEYMOUR, of East Bloomfield, Ontario Co., New-York, for the best Broad Cast Sower—*Diploma* and \$10.

J. DELAFIELD,
 ROSWELL HARMON,
 ANTHONY VAN BERGEN,
 JONATHAN EDGECOMB,
 J. STANTON GOULD,
 SANFORD HOWARD,
 E. P. PRENTICE,
 GEORGE GEDDES,
 JOHN MALLORY,
 ANDREW J. HEERMANCE,
 JOSEPH E. HOLMES,

Committee.



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